



DIY AUTO

SATURDAY MECHANIC

DEGREE OF DIFFICULTY /// MODERATE



We sliced this door open with a plasma cutter to show you how it works. Normally most of this stuff is hidden behind sheetmetal.

GASKET

SLIDER

MOTOR

SWITCH

TRACK

GEARBOX

TRACK MOUNTING

CABLE

Repairing Power Windows

By Mike Allen

Another tollbooth beckons. It's a perfect time to practice slam-dunking quarters into the basket. Coin in hand, you toggle the power window switch. The window snakes its way open a good 3 in.—and then grunts to a halt, forcing you to pop the door open and carefully drop your change into the basket. Now the window won't close, either. It groans as it moves a few millimeters up and stops. After trying to cycle the window mechanism a few times, it stops acknowledging your frantic button-pressing altogether. What doesn't stop is the driving rainstorm, which has already soaked your shirt. Your power window is dead.

There are plenty of things that can keep your power windows from gliding effortlessly up and down. We'll discuss most of them.

Electrical Problems

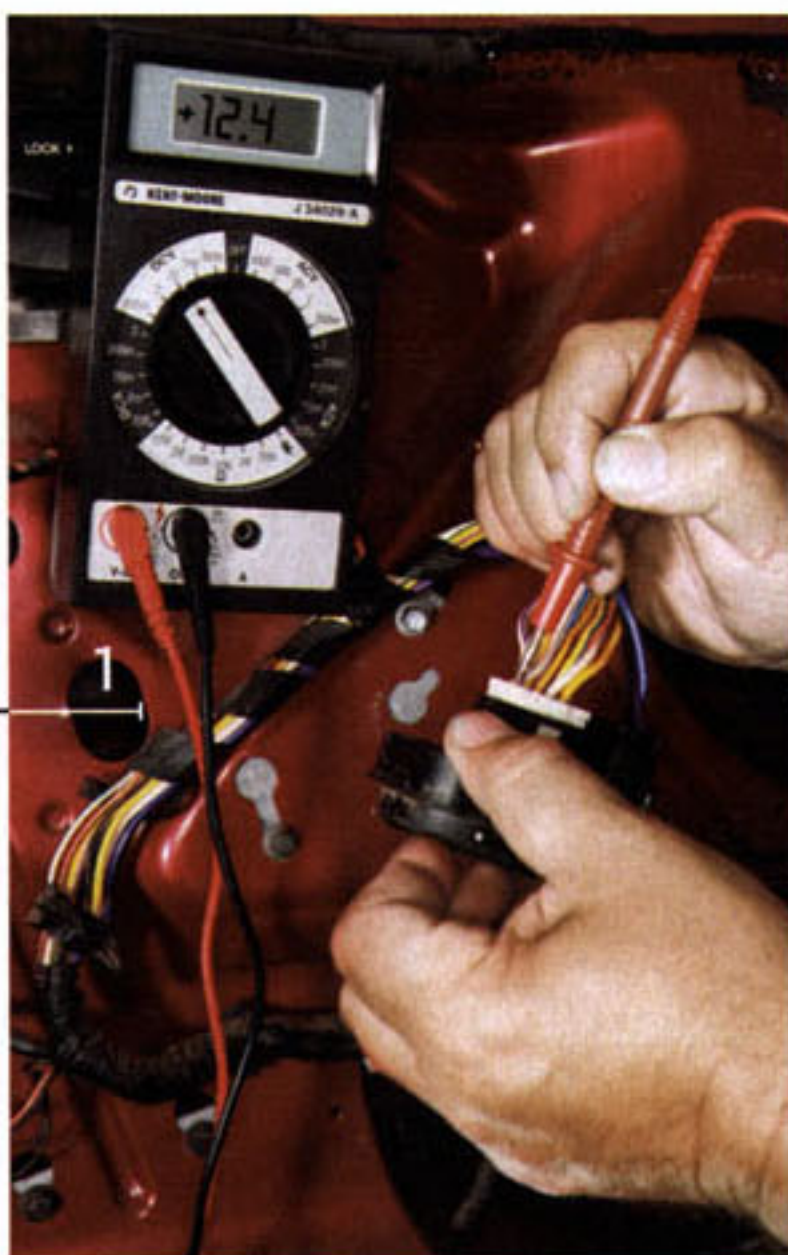
If your windows just won't move at all and the electric motor doesn't twitch, you may have an electrical issue. So none of your windows move when commanded by the switch—even the individual switch on each door, not just the conveniently located master

the problem is, surprise, surprise, ... in the motor.

Does the window move when one of the two switches is pressed, but not the other? You've got a bad switch or possibly bad wiring going to that switch. If you can narrow the open circuit down to the switch, you'll need to replace the switch. This can cost hundreds of dollars, especially on a luxury car. Maybe, just maybe, you can swap the switch mechanism from a different door to the affected door. This will

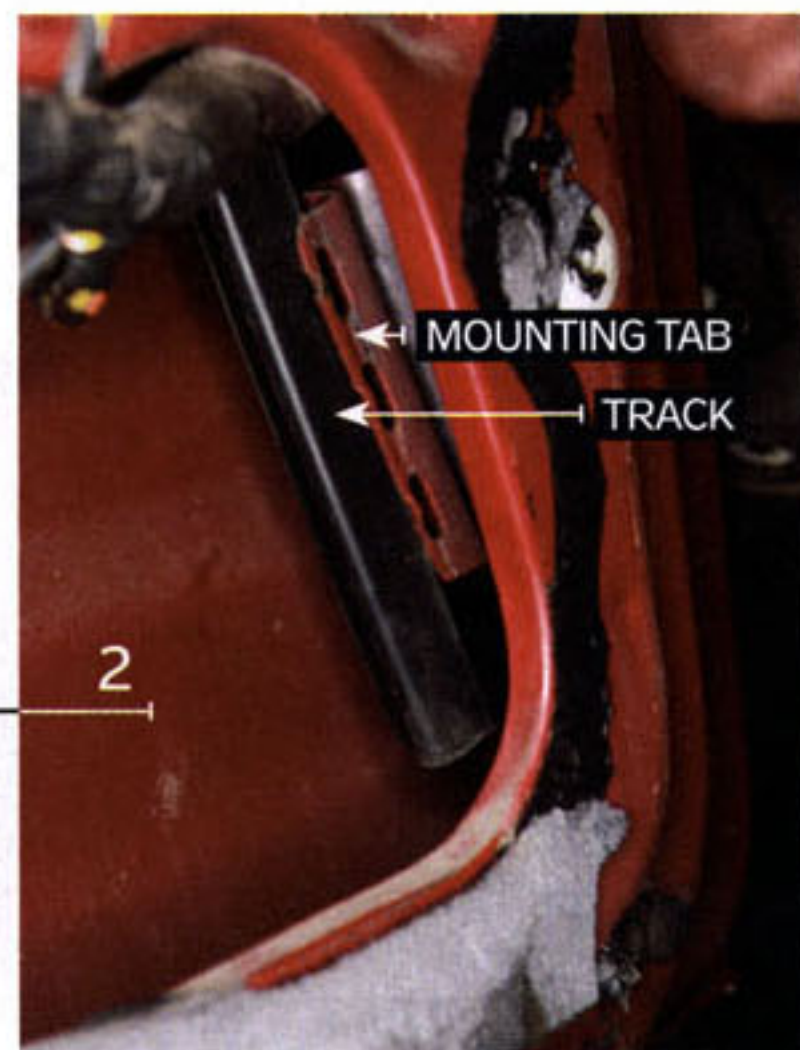
[1] Back-probe the connector to check for voltage to the switch. Don't stick the probe into the front of the connector, or you'll damage the pins.

[2] The track mounting can become dislodged or misaligned and make the window jam. If so, reposition or adjust it.



Eeks and Squeaks

Has the glass been going up and down sporadically for a while, or making embarrassing noises? Carefully check the rubber gaskets the glass travels in and seals against. If the gaskets are squished or torn, sometimes you can rescue them by realigning them in the mounts or even by gluing them down with automotive weatherstrip adhesive. At the very least, wipe the rubber down with silicone. Don't use hydrocarbon-based



switch at the driver's elbow?

Duh. Check the fuse. If that's fine, it's time to get out your test light or trusty voltmeter and back-probe the connector on the switch assembly. Of course, you'll need to access the back of the switch. Some switches are just clipped into the armrest and only need to be teased straight up until the spring clip gives. Others may require you to remove the armrest and/or door panel.

At least one of the wires from the harness to the window switches should have 12 volts when the key is on. If not, you'll need to backtrack the wiring to the open circuit. And if you do see 12 volts, check the wires leading to the motor, which should also read 12 volts when the switch is actuated. If you have voltage going to the motor and the motor isn't turning,

keep whoever is sitting in that seat from opening their own window, but at least you'll be able to roll the window up and down from the driver's seat. Can't find the correct part? Swap the leads around in the multipin connector on the back of the switch.

This wiring isn't very complicated. But if it isn't obvious what wire goes where, you'll need to dig up the schematic diagram to parse through all the color codes on the wires. Don't forget the ground wires, too.

lubricants like grease or Vaseline—they'll degrade the rubber.

One common problem that causes logy windows is simple misalignment of the window's tracks. This can be caused by a trauma as minor as trying to close the door on some foreign object. It even holds true for a sedan-type door with a perimeter window frame. Frameless windows are a little more tolerant. Follow the window as it goes up and down, and check for misalignment. If you pull the door-trim panel off, you should be able to see the bottom of the window track where it attaches to the

doorframe. Our junkyard car door's front-lower-track attachment point was askew, and easily reattached.

Got a window that grinds to a halt and then won't open or close? That was almost certainly caused by a bad gasket or a misaligned track. Frantic toggling of the switch to try and close the window can overheat the motor. These motors have an overheat protection breaker. If you stall the motor long enough to pop it, it will reset itself in a couple of minutes.

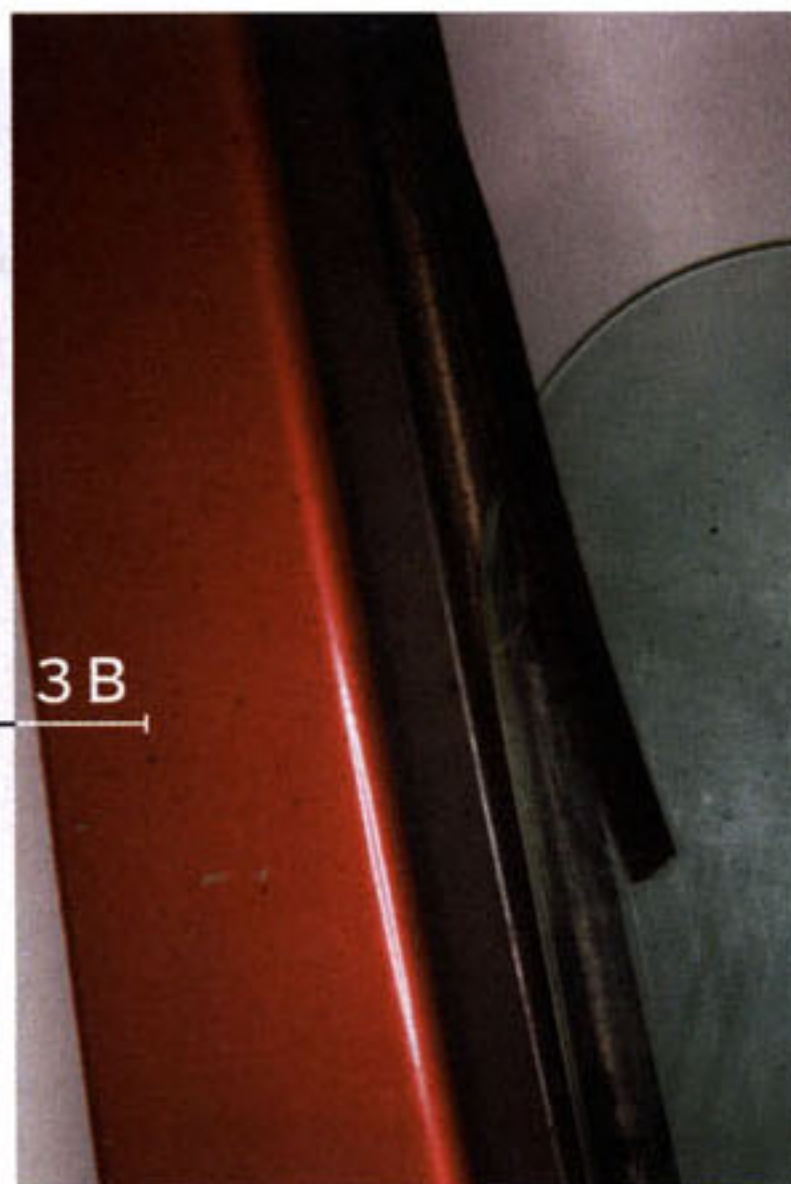
The second was to cut the cable and allow the window to slide into the appropriate position. If you've got a bad motor or gearbox, the cheapest and simplest way to fix it is to get a complete mechanism—cables, gearbox and motor—from a junkyard.

Got a rare or obsolete car with a burned-out electric motor? Take the motor to an electric motor shop. They might be able to fix things like worn-out brushes or a fried commutator.

One fairly uncommon failure mode

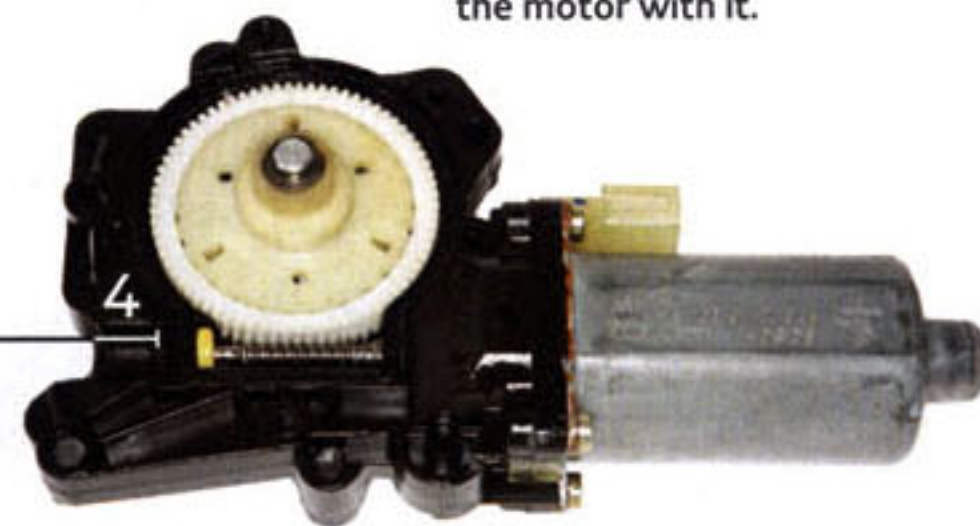
around the inside of the door like a giant mousetrap. Of course, by the time it got to me, the cable was thoroughly tangled. With no shop manual, I had to remove the door panel on the opposite door and copy the cable rigging to get it back together.

Some window mechanisms use a large clock spring to counterbalance the window's weight. This spring is capable of lopping off a finger if you release it inadvertently, according to my old-timer mechanic pal, Lefty.



[3A, 3B] Damaged rubber gaskets and seals are a common cause of balky windows. Some seals can be fixed, but often they need replacement.

[4] The gearbox carries torque from the electrical motor to the mechanism. Stripped gears will necessitate replacing the gearbox, and probably the motor with it.



Digging In

Let's say you've determined the motor is bad. You'll need to remove and replace it. Our sacrificial door was problematic—the window's attachment points to the slider consisted of a plastic fitting clamped onto the window with two 10mm bolts. There were two holes stamped into the door's interior frame to allow access to the bolts. And those holes only aligned with the bolts when the window was open about 5 in.

Of course, if the motor is bad, there's no way to reposition the window to put a socket on the bolts. We had several options. The first option was to break the window, allowing access to the mechanism.

is a bad gearbox. High-mileage vehicles can strip the teeth from the ring gear. If that's the situation, you'll need to replace the entire gearbox, because they don't sell just the gear. Again, your best bet is a junkyard rather than a new-car dealer.

Other Styles

Not all cars use this simple, cable-operated window mechanism. There are scissors-type and even jack-screws. I once restored a Ferrari that had a good 10 ft. of cable strung

Don't Panic

One last thing: You've got the door panel off and discover that your burned-out motor is actually riveted to the doorframe. To replace the motor, you'll have to drill out the rivets. Start by center-punching the rivets, then drill them completely through with a 1/8-in. bit. Follow up with a 3/8-in. bit to shave the rivet head off. This will keep your bit centered on the rivet, and you won't make the motor's mounting holes egg-shaped. Replace them with the appropriate bolts and nuts. **PM**

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